EMC TEST REPORT

Project No.	LBE20111418	**Issue No.**	0
Applicant	**Name of organization**	**Samsung Electronics Co., Ltd.**	
	Address	416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do 443-742 Korea	
	Date of application	September 14, 2011	
EUT	**Type of device**	Class B personal computers and peripherals	
	Equipment authorization	☐ Declaration of Conformity ☒ Certification ☐ Verification	
	FCC ID	**A3LML3750ND**	
	Kind of product	**MONO LASER PRINTER**	
	Model No.	**ML-3750ND**	
	Variant Model No.	**None**	
	Manufacturer	**1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, Korea 730-030 2) Samsung Electronics (Shandong) Digital Printing Co., Ltd. 264209, Samsung Road, Weihai Hi-Tech. IDZ, Shandong Province, P.R.China 3) Weihai Shin Heung Digital Electronics Co., Ltd. 98, Samsung Road, Weihai Hi-Tech. IDZ, Shandong Province, P.R.China 4) Intops : Intops (Weihai) Electronics Co., Ltd., Keji Road-268-1 , Weihai Hi-Tech,Industries Development Zone Shandong Province , CHINA**	
Applied Standards		FCC Part 15, Subpart B / ANSI C63.4-2009	
Test Period		September 14, 2011 ~ September 15, 2011	
Issue date		September 21, 2011	

Test result : **Complied**

The equipment under test has found to be compliant with the applied standards.
The result is not applied the uncertainty concept.
This mean that the result is applied the original (standard) limit.
(Refer to the attached test result for more detail.)

Tested by : Young-Man Lee

Reviewed by : Tae-Young Jang

SAMSUNG

416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742 Korea
Tel: 82 31 277 7752, Fax: 82 31 277 7753

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1. Report information

1.1 Revision history

No.	Revised detailed information
Issue 0	There are no revisions and this version is basic test report.

1.2 Sample calculation

1.2.1 Conducted disturbance (at 10 MHz)

- Class B limit = 60 dBμV (Quasi-peak limit)
- Level (50 dBμV) = Meter Reading (40.2 dBμV) + factor (9.8 dB, AMN factor 9.7 dB + Cable loss 0.1 dB)
- Margin (10 dB) = Limit (60 dBμV) – Level (50 dBμV) = 10 dB below limit

1.2.2 Radiated disturbance (at 100 MHz)

- Class B limit = 40 dBμV/m at 3 m
- Level (30 dBμV/m) = Meter Reading (50 dBμV) + factor (- 20 dB(1/m), antenna factor + cable loss – amplifier gain)
- Margin (10 dB) = Limit (40 dBμV/m) – Level (30 dBμV/m) = 10 dB below limit

2. Summary of test results

2.1 Emission

The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Result
☒	Conducted Disturbance (Mains Port)	FCC Part 15 Subpart B / ANSI C63.4-2009	Complied
☒	Radiated Disturbance		Complied

3. General Information

3.1 Test facility

The CS & Environment center is located on Samsung Electronics Co., Ltd. at 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, South Korea.
All testing are performed in Semi-anechoic chambers conforming to the site attenuation Characteristics defined by ANSI C63.4, CISPR 22, 16-1 and 16-2. and Shielded rooms.

The CS & Environment center is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:2005.

4. Test Setup configuration

4.1 Test configuration

4.1.1 Test Peripherals

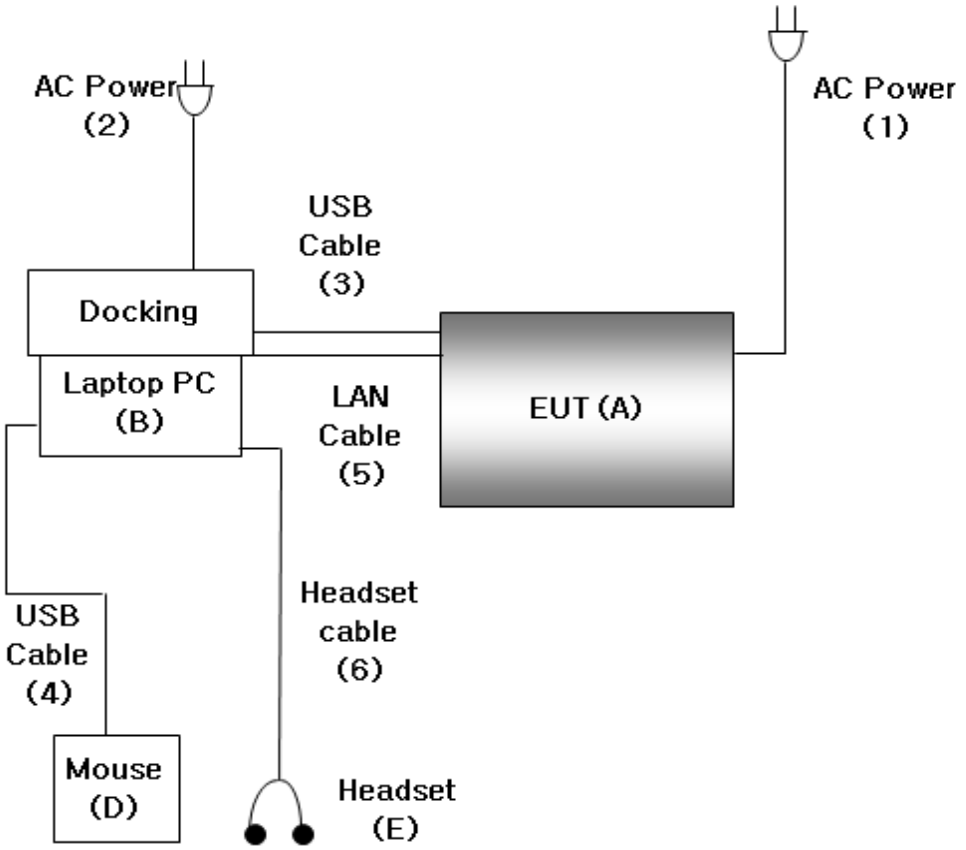
The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.
The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Seq	Description	Model No.	Serial No.	Manufacturer	Fcc ID / DoC
A	Mono Laser Printer	ML-3750ND	-	SAMSUNG	A3LML3750ND
B	NOTE PC	PP18L	27182225373	DELL	DoC
C	Docking	PD01X	CN-0HD026-48643-83K-2196	DELL	DoC
D	USB mouse	SC-1000	1034000243	SAMSUNG	-
E	Headset	-	-	SAMSUNG	-

4.1.2 Test cables

No.	Connected cable	Length [m]	Shielded [Y/N]	Note
1	Power	1.8	No	For EUT
2	Power	1.8	No	For Notebook PC
3	USB	1.8	Yes	EUT to Notebook PC
4	USB	1.8	Yes	Notebook PC to USB Mouse
5	NETWORK	2.0	No	From EUT to hub(Notebook PC)
6	Head set	1.5	No	For Note PC to Head set

4.1.3 Test arrangement



4.2 EUT operating mode

To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating Mode 1	Standby
Operating Mode 2	USB Printing(Duplex)
Operating Mode 2	Network Printing(Duplex)

4.3 Details of Sampling

Customer selected, two units

(One with SMPS of LITEON and another with SMPS of Dongyang)

4.4 Clock Frequencies

Kind of Clocks	Frequency[MHz]	Kind of Clocks	Frequency[MHz]
Main Source Clock	12	Video Clock	22.137
CPU Internal Clock	533	DDR3 Clock	377
USB Device Clock	12	BUS Device Clock	150.8

4.5 EUT Description

The following features describe EUT represented by this report:

Item	Specification and Description
Processor	CHORUS3-NEXT(533MHz)
Standard System memory	128MB DDR3 SDRAM
Resolution	True 600x600dpi (Up to 1,200x1,200dpi effective output)
Paper Handling	Paper Tray(standard) 250Sheets Manual Tray 50Sheet
Power Rating	110~127VAC, 6.5A, 50/60Hz
Power Consumption	Sleep mode : 2Watts Ready mode : 60Watts Printing mode: 550Watts
Printer Language	PostScript3, PCL6/5e, IBM ProPrinter, EPSON
PC Interfaces	USB2.0, NW
OS compatibility	Windows 2000/XP(32/64bits)/ Vista(32/64bits)/2003 Server(32/64bits)/2008 Server(32/64bits)/ 7(32/64bit)/2008 Server R2 Various Linux OS: Fedora Core 4, 5, 6 Fedora 7, 8, 9, 10, 11, 12 RedHat Enterprise Linux WS 4, 5 SuSE 10.0, 10.1 openSuSE 10.2, 10.3, 11.0, 11.1, 11.2 SuSE Linux Enterprise Desktop 10, 11 Debian 4.0, 5.0 Ubuntu 5.04, 5.10, 6.04, 6.10, 7.04, 7.10, 8.04, 8.10, 9.04, 9.10 Mandriva 2005LE, 2006, 2007, 2007.1, 2008, 2008.1, 2009, 2009.1
Modes of Operation	USB Printing, 1200dpi Printing, Network Printing
Intended Class for Emissions	Class B

4.6 Test configuration and condition

The system was configured for testing in typical fashion use. Cables were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables. The mode of operation utilized for testing was selected to best simulate typical EUT use.

- **Configuration 1 : Dongyang SMPS applied**
- **Configuration 2 : LITEON SMPS applied**

The EUT was measured all testing with toner cartridge.

Power source for the EUT operating was supplied by CVCF made by the Pacific Corp.

- Test Voltage : AC 120 V, 60 Hz

4.7 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4 and UKAS Lab 34.)

4.7.1 Emission

Test type		Measurement uncertainty (C.L. 95 %, k = 2)
Conducted disturbance	Main terminal	3.30 dB
Radiated Disturbance (Below 1 GHz)	Horizontal	5.26 dB
	Vertical	5.27 dB
Radiated Disturbance (Above 1 GHz)	Horizontal	3.40 dB
	Vertical	3.12 dB

5. Results of individual test

5.1 Conducted disturbance

Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

Limits for conducted disturbance at the mains ports of class B ITE

Frequency range Limits MHz	Resolution Bandwidth	Limits dBµV	
		Quasi-peak	Average
0.15 to 0.50	9 kHz	66 to 56	56 to 46
0.50 to 5	9 kHz	56	46
5 to 30	9 kHz	60	50
NOTE 1 The lower limit shall apply at the transition frequency NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.			

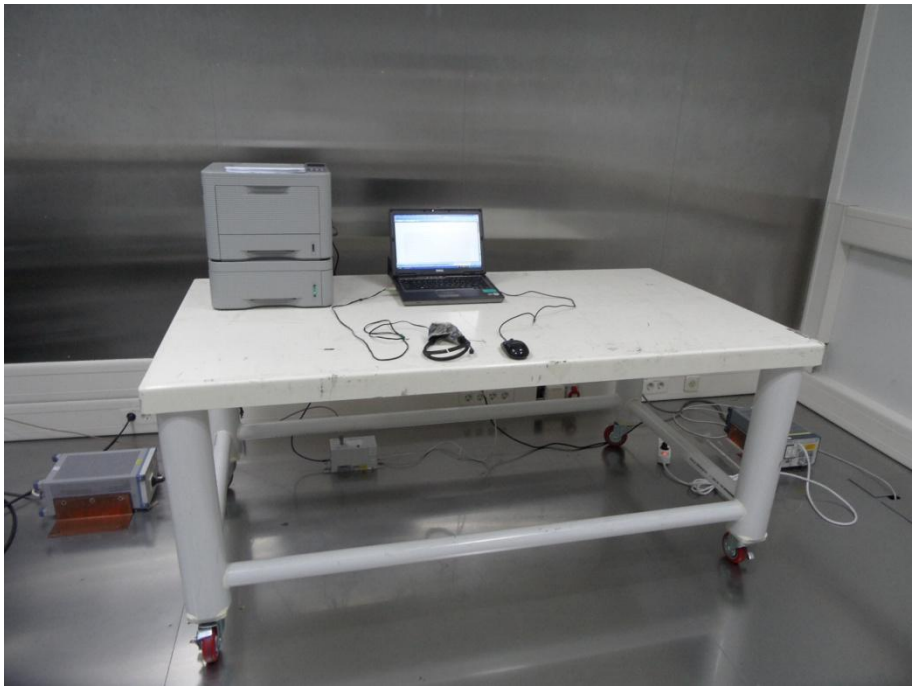
5.1.1 Test instrumentation

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Measuring receiver	ESIB26	R&S	100147	2011-04-07	12
Artificial mains network	ENV216	R&S	100117	2010-11-16	12
Artificial mains network	ESH3-Z5	R&S	100262	2010-09-27	12
Test software	EMC32	R&S	Ver 5.20.1	N/A	N/A

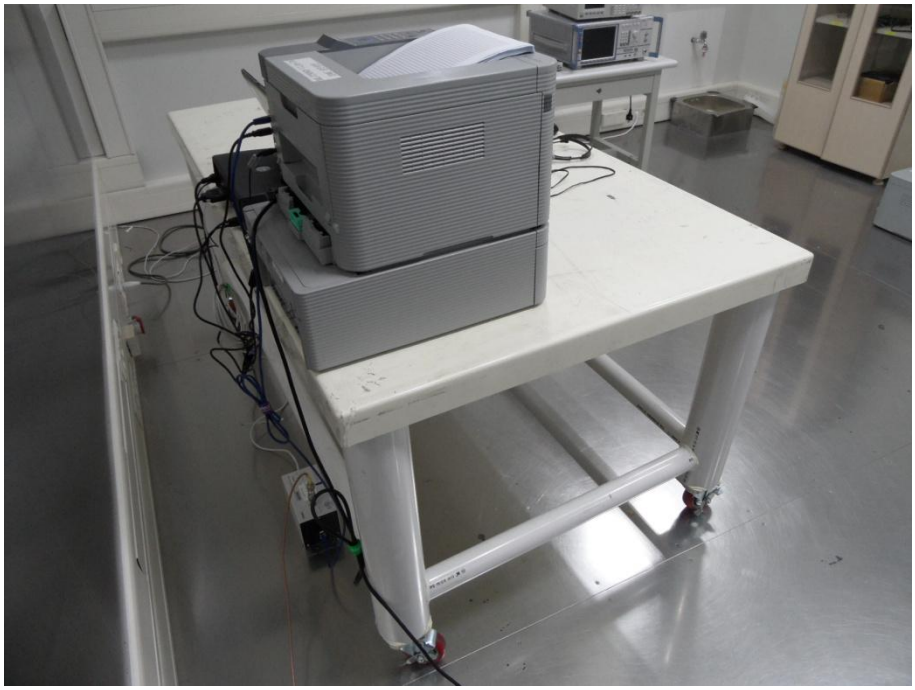
5.1.2 Temperature and humidity condition

Test date	September 15, 2011	**Test engineer**	Young-Man Lee	
Climate condition	**Ambient temperature**	23.6 ℃	**Relative humidity**	35 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #1			

5.1.3 Photograph of Test Setup



Front



Rear

5.1.4 Test results (mains port)

- **Configuration 1, Operating Mode 1 : Standby Mode**

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

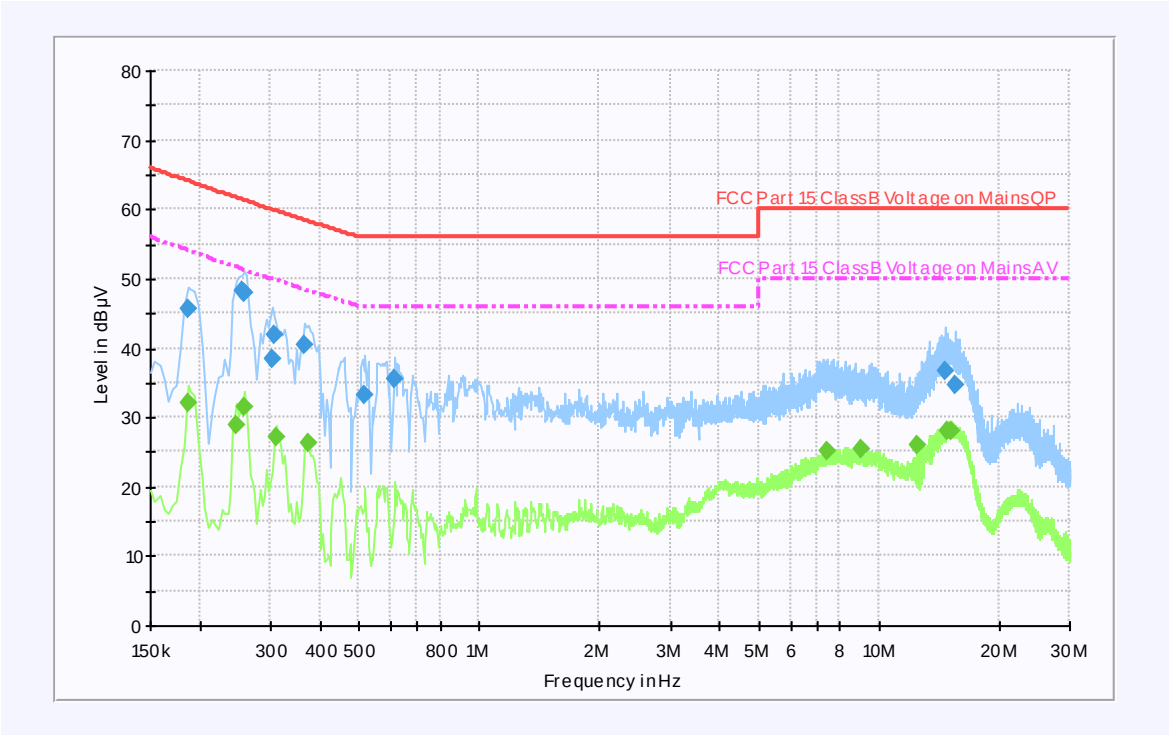
Frequency Range:	150 kHz – 30 MHz
Receiver:	ESIB 26
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: ITE_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dBµV

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz – 30 MHz	Quasi Peak; Average	9 kHz	15 s	ESIB 26

Test Graph



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency (MHz)	Level Quasi-Peak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186	45.7	L1	10.2	18.4	64.1
0.254	48.1	L1	10.0	13.3	61.4
0.258	48.1	L1	10.0	13.2	61.3
0.302	38.5	L1	10.1	21.5	60.0
0.306	41.8	L1	10.1	18.1	59.9
0.366	40.4	L1	10.1	18.0	58.4
0.518	33.2	N	10.1	22.8	56.0
0.614	35.6	L1	10.1	20.4	56.0
14.704	36.6	L1	10.0	23.4	60.0
15.556	34.8	L1	10.0	25.2	60.0

Average final measurement results table

Frequency (MHz)	Level Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186	32.1	L1	10.2	22.0	54.1
0.246	28.8	N	10.0	22.9	51.7
0.258	31.6	L1	10.0	19.7	51.3
0.310	27.1	L1	10.1	22.6	49.7
0.374	26.3	L1	10.1	21.9	48.2
7.408	25.3	N	9.8	24.7	50.0
9.060	25.4	N	9.9	24.6	50.0
12.544	25.9	N	10.0	24.1	50.0
14.768	28.1	N	10.1	21.9	50.0
15.136	28.1	N	10.1	21.9	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- **Configuration 1, Operating Mode 2 : USB Printing(Duplex)**

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

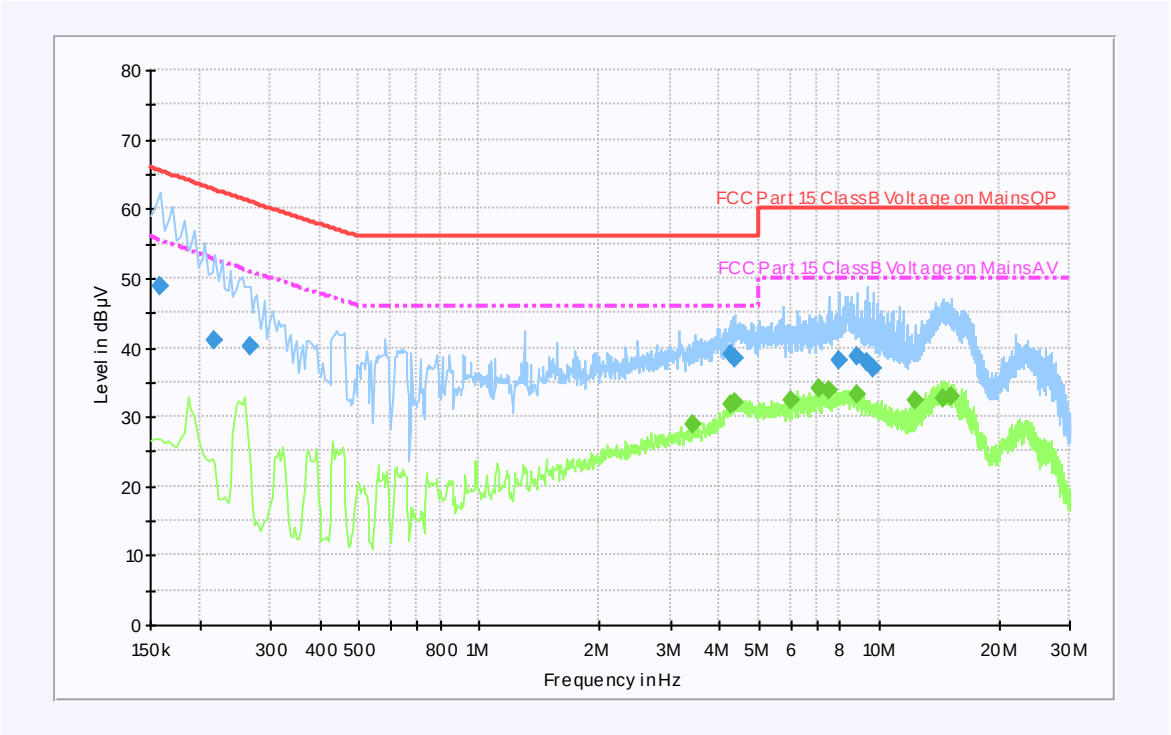
Frequency Range:	150 kHz – 30 MHz
Receiver:	ESIB 26
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: ITE_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dBµV

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz – 30 MHz	Quasi Peak; Average	9 kHz	15 s	ESIB 26

Test Graph



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency (MHz)	Quasi-Peak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158	48.7	N	10.1	16.8	65.5
0.218	41.1	N	10.0	21.6	62.7
0.266	40.1	L1	10.0	20.9	61.0
4.268	39.0	N	9.8	17.0	56.0
4.340	38.4	L1	9.8	17.6	56.0
7.964	38.2	L1	9.8	21.8	60.0
8.824	38.7	L1	9.8	21.3	60.0
9.304	37.8	L1	9.9	22.2	60.0
9.680	36.9	L1	9.9	23.1	60.0

Average final measurement results table

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
3.428	28.9	N	9.8	17.1	46.0
4.272	31.9	N	9.8	14.1	46.0
4.364	32.1	N	9.8	13.9	46.0
6.020	32.5	N	9.8	17.5	50.0
7.088	34.2	N	9.8	15.8	50.0
7.516	33.9	N	9.8	16.1	50.0
8.800	33.2	N	9.9	16.8	50.0
12.336	32.3	N	10.0	17.7	50.0
14.564	32.5	L1	10.0	17.5	50.0
15.204	32.8	L1	10.0	17.2	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) +
Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- **Configuration 1, Operating Mode 3 : NETWORK Printing(Duplex)**

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

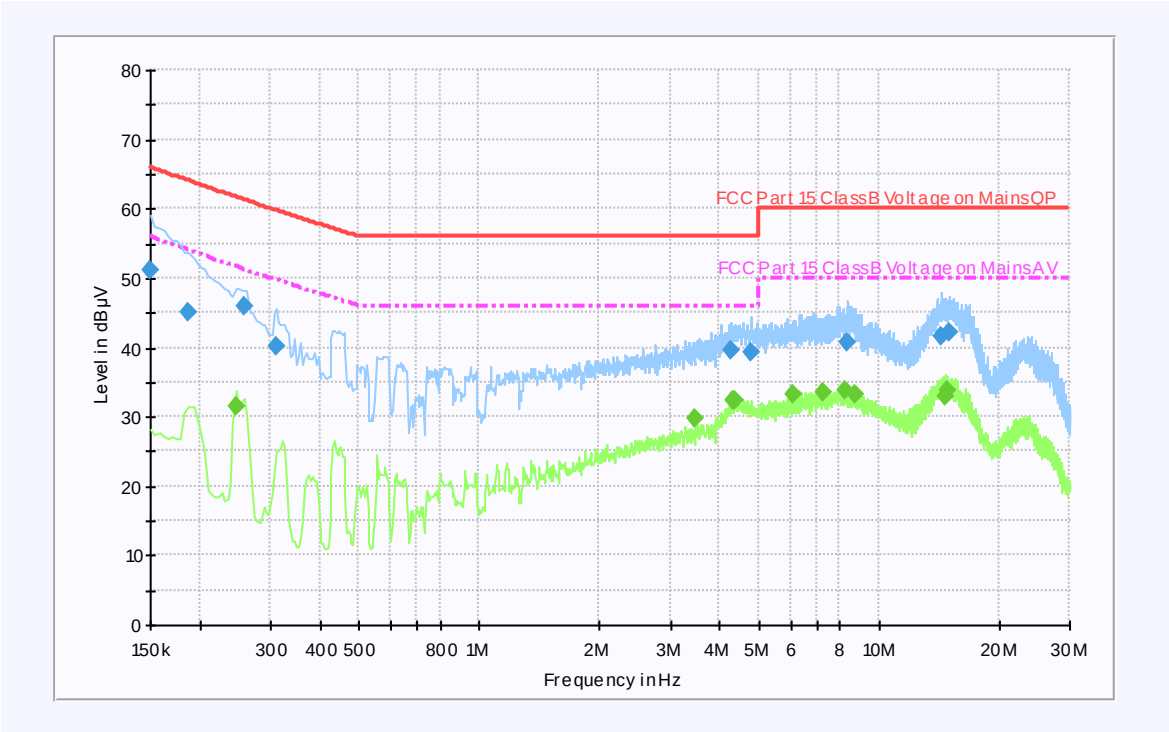
Frequency Range:	150 kHz – 30 MHz
Receiver:	ESIB 26
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: ITE_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dBµV

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz – 30 MHz	Quasi Peak; Average	9 kHz	15 s	ESIB 26

Test Graph



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency (MHz)	Quasi-Peak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150	51.1	N	10.4	14.9	66.0
0.186	45.1	L1	10.2	19.0	64.1
0.258	46.0	L1	10.0	15.3	61.3
0.310	40.3	L1	10.1	19.5	59.8
4.272	39.5	L1	9.8	16.5	56.0
4.792	39.3	N	9.8	16.7	56.0
8.376	40.8	L1	9.8	19.2	60.0
14.260	41.6	L1	10.0	18.4	60.0
15.068	42.0	L1	10.0	18.0	60.0

Average final measurement results table

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246	31.5	N	10.0	20.2	51.7
3.484	29.6	N	9.8	16.4	46.0
4.292	32.3	N	9.8	13.7	46.0
4.364	32.2	N	9.8	13.8	46.0
6.112	33.2	N	9.8	16.8	50.0
7.276	33.6	N	9.8	16.4	50.0
8.252	33.7	N	9.9	16.3	50.0
8.740	33.3	N	9.9	16.7	50.0
14.624	33.0	L1	10.0	17.0	50.0
14.804	33.7	N	10.1	16.3	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) +
Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- **Configuration 2, Operating Mode 1 : Standby Mode**

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

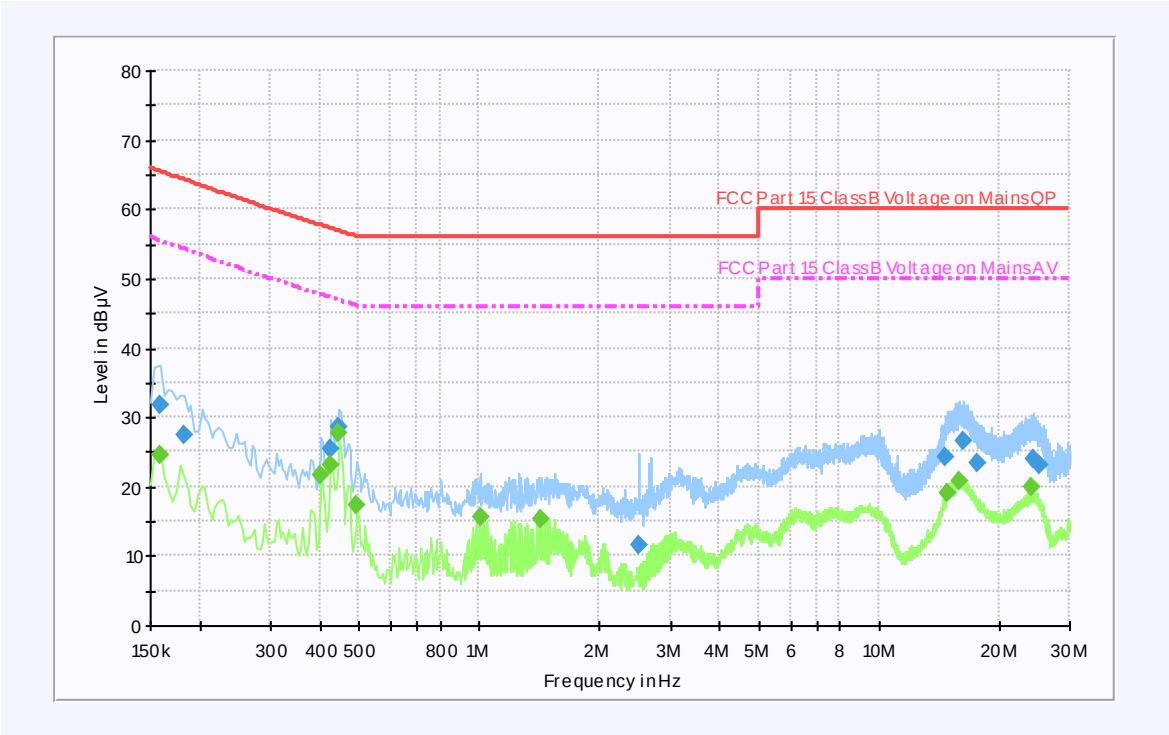
Frequency Range:	150 kHz – 30 MHz
Receiver:	ESIB 26
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: ITE_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dBµV

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz – 30 MHz	Quasi Peak; Average	9 kHz	15 s	ESIB 26

Test Graph



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency (MHz)	Level Quasi-Peak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158	31.8	L1	10.1	33.7	65.5
0.182	27.6	N	10.2	36.7	64.3
0.426	25.4	N	10.1	31.8	57.2
0.446	28.7	N	10.1	28.2	56.9
2.516	11.5	N	9.8	44.5	56.0
14.680	24.2	N	10.1	35.8	60.0
16.228	26.6	N	10.1	33.4	60.0
17.676	23.4	L1	10.0	36.6	60.0
24.312	24.1	L1	10.2	35.9	60.0
25.300	23.0	N	10.4	37.0	60.0

Average final measurement results table

Frequency (MHz)	Level Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158	24.6	L1	10.1	30.9	55.5
0.402	21.7	N	10.1	26.0	47.7
0.426	23.1	N	10.1	24.1	47.2
0.446	27.6	N	10.1	19.3	46.9
0.494	17.2	N	10.1	28.9	46.1
1.004	15.5	N	9.9	30.5	46.0
1.432	15.3	N	9.9	30.7	46.0
14.788	19.1	N	10.1	30.9	50.0
15.840	20.9	N	10.1	29.1	50.0
23.988	20.0	L1	10.2	30.0	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- **Configuration 2, Operating Mode 2 : USB Printing(Duplex)**

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

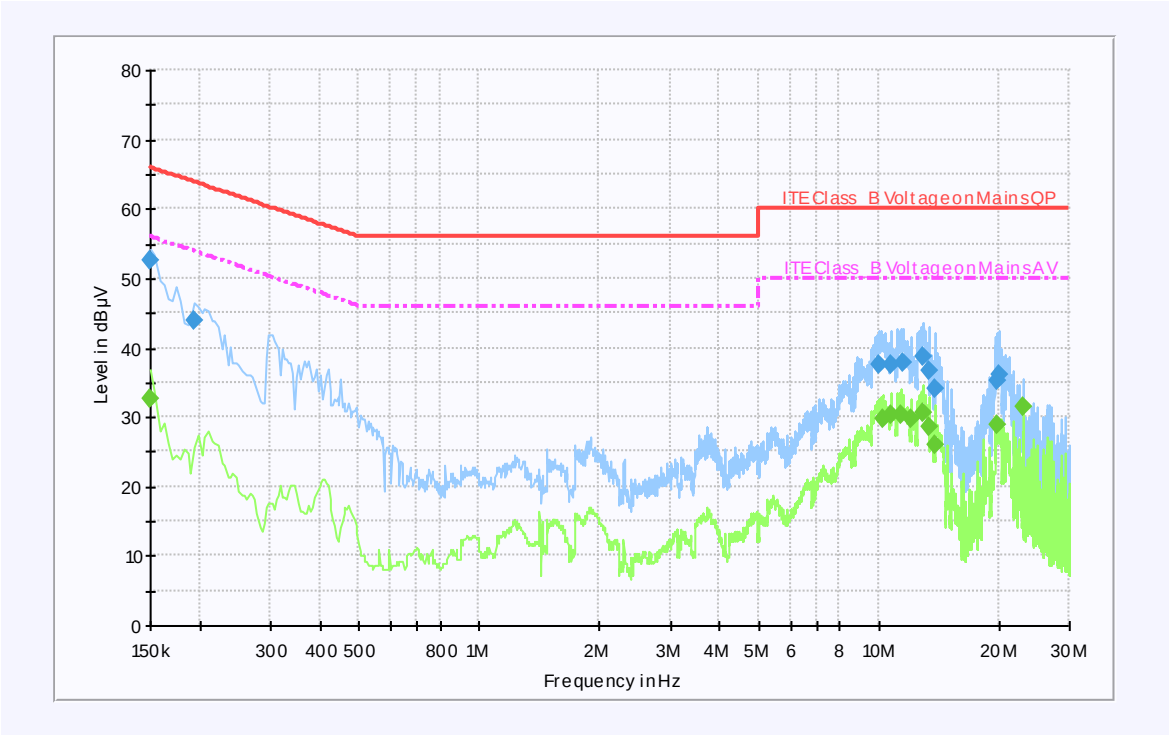
Frequency Range:	150 kHz – 30 MHz
Receiver:	ESIB 26
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: ITE_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dBµV

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz – 30 MHz	Quasi Peak; Average	9 kHz	15 s	ESIB 26

Test Graph



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency (MHz)	Quasi-Peak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150	52.7	N	10.4	13.4	66.0
0.194	44.0	N	10.1	19.9	63.9
10.028	37.6	N	9.9	22.4	60.0
10.692	37.5	N	9.9	22.5	60.0
11.492	37.9	N	10.0	22.1	60.0
12.912	38.6	N	10.0	21.4	60.0
13.408	36.8	N	10.0	23.2	60.0
13.784	34.0	N	10.0	26.0	60.0
19.724	35.3	L1	10.1	24.7	60.0

Average final measurement results table

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150	32.7	N	10.4	23.3	56.0
10.196	29.7	N	9.9	20.3	50.0
10.692	30.3	N	9.9	19.7	50.0
11.328	30.2	N	10.0	19.8	50.0
12.048	29.6	N	10.0	20.4	50.0
12.868	30.6	N	10.0	19.4	50.0
13.404	28.6	N	10.0	21.4	50.0
13.784	26.1	N	10.0	23.9	50.0
19.708	29.0	L1	10.1	21.0	50.0
23.128	31.6	N	10.3	18.4	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- **Configuration 2, Operating Mode 3 : NETWORK Printing(Duplex)**

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

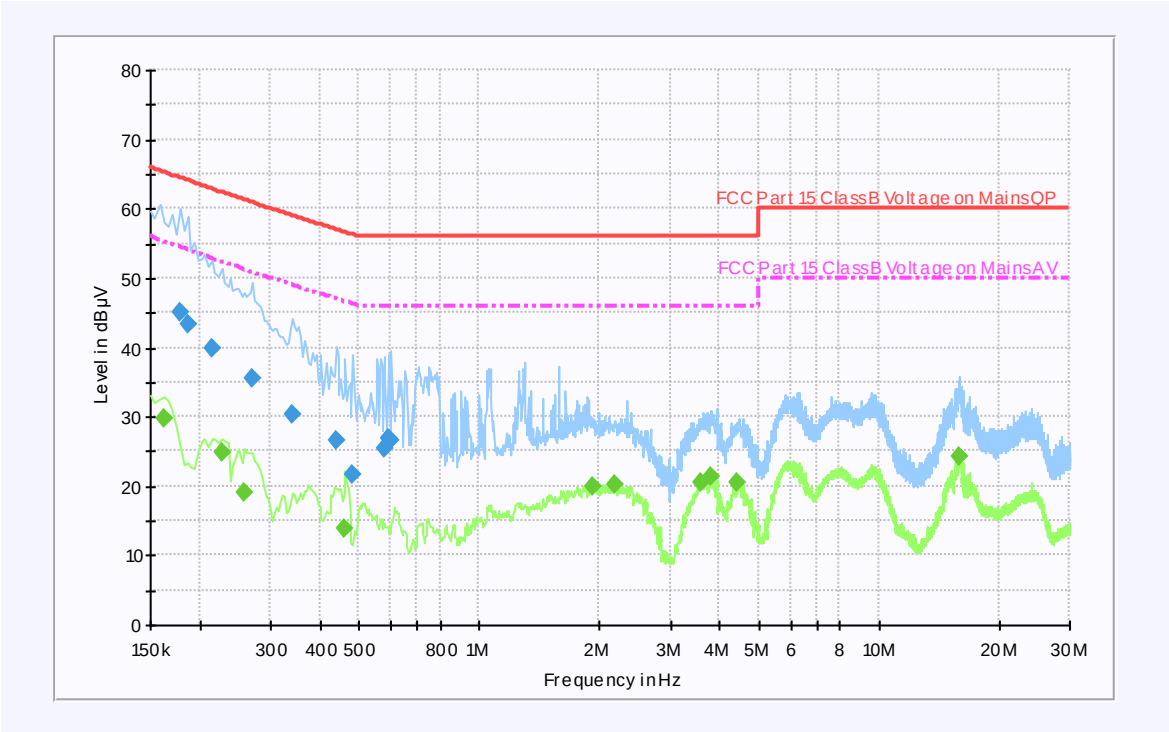
Frequency Range:	150 kHz – 30 MHz
Receiver:	ESIB 26
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: ITE_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dBµV

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz – 30 MHz	Quasi Peak; Average	9 kHz	15 s	ESIB 26

Test Graph



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency (MHz)	Quasi-Peak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.178	44.9	L1	10.2	19.6	64.5
0.186	43.3	L1	10.2	20.8	64.1
0.214	40.0	N	10.0	22.9	62.9
0.270	35.5	N	10.0	25.4	60.9
0.342	30.4	N	10.1	28.6	59.0
0.438	26.7	L1	10.1	30.3	57.0
0.482	21.7	L1	10.1	34.6	56.3
0.578	25.5	N	10.1	30.5	56.0
0.594	26.8	N	10.1	29.2	56.0
0.602	26.5	N	10.1	29.5	56.0

Average final measurement results table

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.162	29.7	L1	10.2	25.6	55.3
0.226	24.7	L1	10.0	27.7	52.4
0.258	19.2	N	10.0	32.1	51.3
0.462	13.7	N	10.1	32.9	46.6
1.916	20.0	N	9.8	26.0	46.0
2.172	20.3	N	9.8	25.7	46.0
3.580	20.6	N	9.8	25.4	46.0
3.808	21.4	N	9.8	24.6	46.0
4.416	20.4	N	9.8	25.6	46.0
15.920	24.2	N	10.1	25.8	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) +
Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

5.2 Radiated disturbance

Of those disturbances above (*L* – 20 dB), where *L* is the limit level in logarithmic units, record at least the disturbance levels and the frequencies of the six highest disturbances.
The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin. All measurements were taken utilizing quasi-peak detection unless stated otherwise.
Measurements were performed at an antenna to EUT distance of 10 m and elevated between 1 m and 4 m.
Both vertical and horizontal antenna polarizations were measured.

Limits for radiated disturbance of ITE at a measuring distance of 10 m

Frequency range Limits MHz	Resolution Bandwidth	Quasi-peak Limits dBµV/m
		Class B
30 to 230	120 kHz	30
230 to 1 000	120 kHz	37
NOTE 1 The lower limit shall apply at the transition frequency NOTE 2 Additional provisions may be required for cases where interference occurs.		

Peak measurements were made over the changeable frequency range 1 GHz to 40 GHz or 5th in accordance with internal maximum operating frequency at a measurement distance of 3 m for the following antenna and turntable arrangements:

Antenna Height (cm)	Antenna Polarisation	Turntable position (degrees)
100 ~ 400	**Horizontal, Vertical**	**Continuous**

Above 1 GHz, peak detector function mode is used with a resolution bandwidth of 1 MHz and a video bandwidth of 1 MHz.

Limits for above 1GHz radiated disturbance of ITE at a measuring distance of 3 m

Class	Limits - dB(μV/m)	
	Peak	Average
B	**74**	**54**
Average limit 500, 20 log 500 = 53.979 dB ≒ 54 dB		

Measurements within 20 dB of the limit were then maximized by adjusting turntable position. Final measurements were made using a average detector.

Results checked manually; and points close to the limit line were re-measured.

5.2.1 Test instrumentation

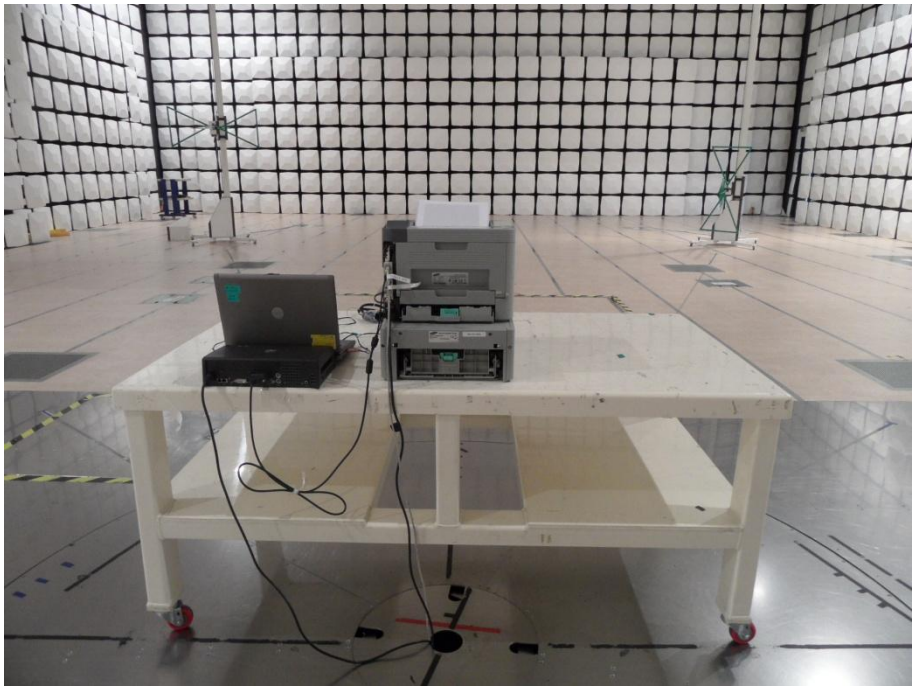
Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Bi-con Antenna	CBL6112D	Schaffner	22602	2010-04-21	24
Horn Antenna	HF907	R&S	100166	2010-01-20	24
EMI Receiver	ESIB-26	R&S	100288	2011-06-16	12
Amplifier	310N	Agilent	185861	2011-04-07	12
Preamplifier	SCU_F018	R&S	10001	2011-05-03	12
Antenna Mast	MA4000	INN CO	-	N/A	N/A
Mast Controller	CO2000	INN CO	-	N/A	N/A
Test software	EP5/RE	TOYO	VER 3.1.20	N/A	N/A
RF Selector	NS4900	TOYO	-	N/A	N/A

5.2.2 Temperature and humidity condition

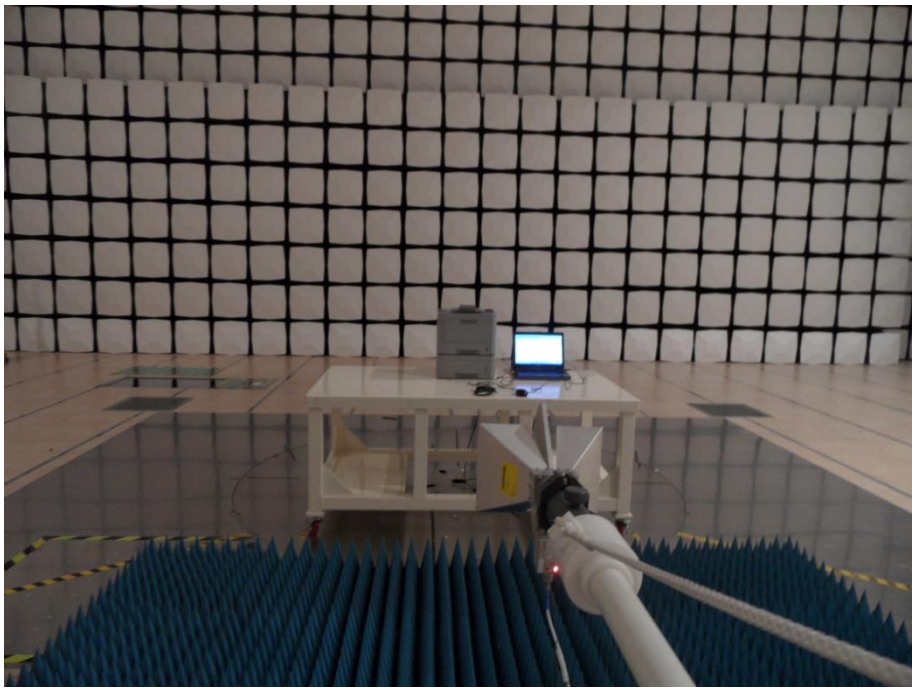
Test date	September 14, 2011	**Test engineer**	Young-Man Lee	
Climate condition	**Ambient temperature**	24.1 ℃	**Relative humidity**	36 %
	Atmospheric pressure	100.9 kPa		
Test place	10 m Semi-Anechoic Chamber			

5.2.3 Photograph of Test Setup

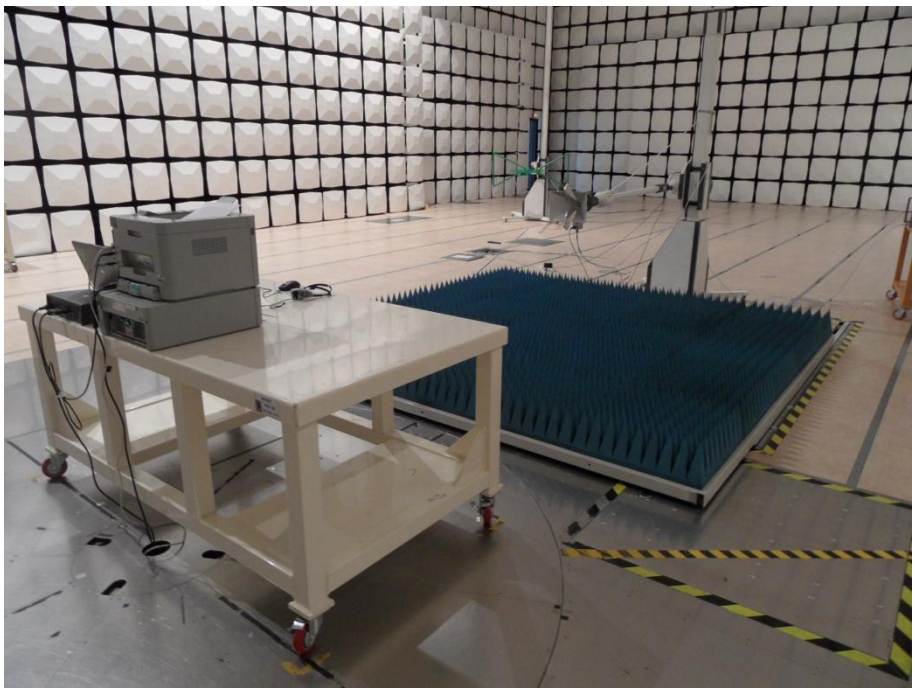
Front (Below 1 GHz)



Rear (Below 1 GHz)



Front (above 1 GHz)



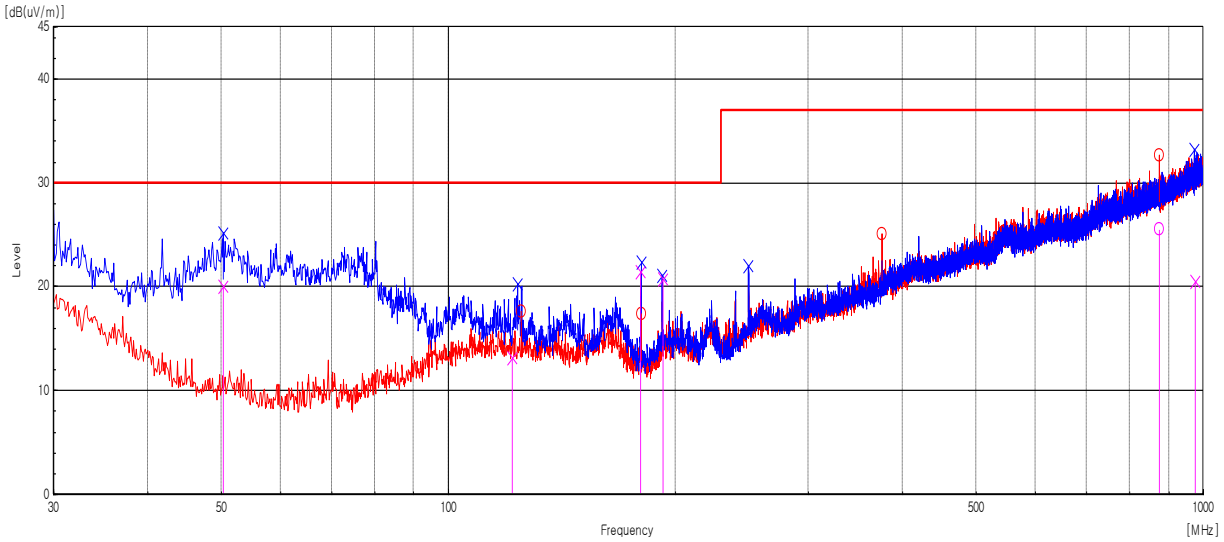
Rear (above 1 GHz)

5.2.4 Test results

5.2.4.1 30 MHz to 1 GHz test results

- **Configuration 1, Operating Mode 1 : Standby**

Test Graph and Results

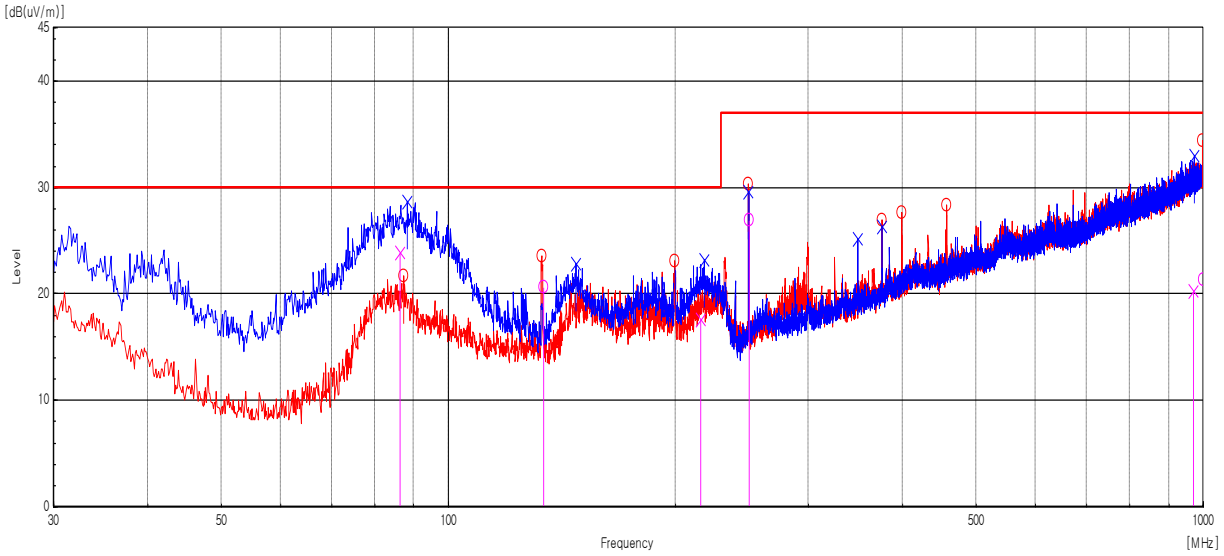


Frequency [MHz]	POL	Reading QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
50.267	V	42.9	-22.9	20.0	30.0	10	135	344.2
121.451	V	30.1	-16.9	13.2	30.0	16.8	187	125.6
179.874	V	40.6	-19.2	21.4	30.0	8.6	123	2.4
192.336	V	40.8	-20.1	20.7	30.0	9.3	131	6.5
874.887	H	27.7	-2.2	25.5	37.0	11.5	394	138.1
975.348	V	20.9	-0.4	20.5	37.0	16.5	287	230.1

Note) Receiving antenna polarization : Horizontal and/or Vertical
Test Distance : 10 m, Antenna Height : 1 m to 4 m
Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)
Margin QP (Quasi-Peak) = Limit – Level QP

- **Configuration 1, Operating Mode 2 : USB Printing(Duplex)**

Test Graph and Results

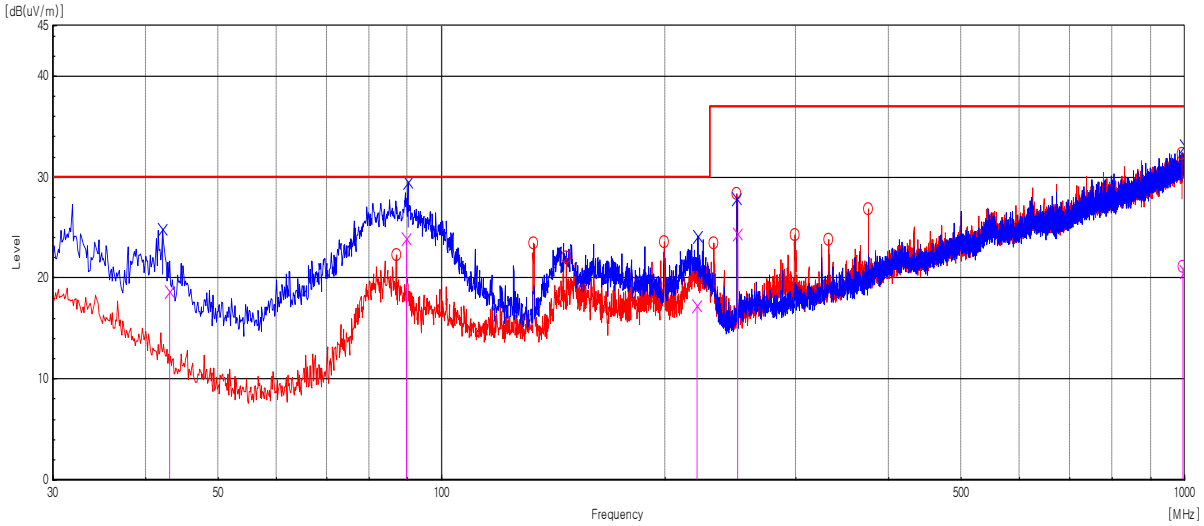


Frequency [MHz]	POL	Reading QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP[dB]	Height [cm]	Angle [deg]
43.023	V	38.5	-19.8	18.7	30.0	11.3	134	267.4
89.784	V	44.5	-20.6	23.9	30.0	6.1	104	24.7
220.523	V	36.1	-18.8	17.3	30.0	12.7	222	130.2
250.013	V	39.8	-15.4	24.4	37.0	12.6	103	113.4
993.764	H	21.0	0.1	21.1	37.0	15.9	397	35.6
999.891	V	20.5	0.1	20.6	37.0	16.4	108	355.3

Note) Receiving antenna polarization : Horizontal and/or Vertical
Test Distance : 10 m, Antenna Height : 1 m to 4 m
Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)
Margin QP (Quasi-Peak) = Limit – Level QP

- **Configuration 1, Operating Mode 3 : NETWORK Printing(Duplex)**

Test Graph and Results

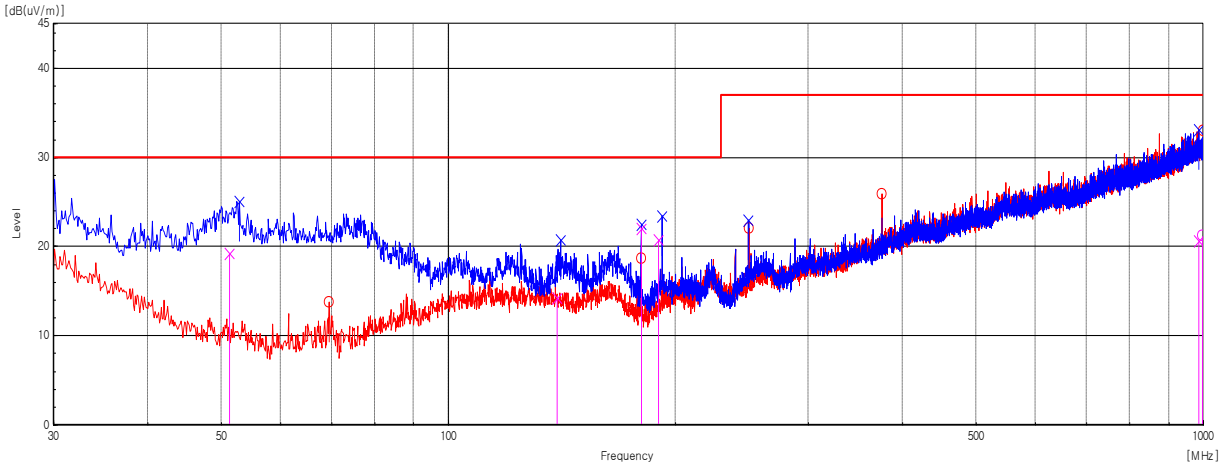


Frequency [MHz]	POL	Reading QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP[dB]	Height [cm]	Angle [deg]
43.023	V	38.5	-19.8	18.7	30.0	11.3	134	267.4
89.784	V	44.5	-20.6	23.9	30.0	6.1	104	24.7
220.523	V	36.1	-18.8	17.3	30.0	12.7	222	130.2
250.013	V	39.8	-15.4	24.4	37.0	12.6	103	113.4
993.764	H	21.0	0.1	21.1	37.0	15.9	397	35.6
999.891	V	20.5	0.1	20.6	37.0	16.4	108	355.3

Note) Receiving antenna polarization : Horizontal and/or Vertical
Test Distance : 10 m, Antenna Height : 1 m to 4 m
Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)
Margin QP (Quasi-Peak) = Limit – Level QP

- **Configuration 2, Operating Mode 1 : Standby**

Test Graph and Results

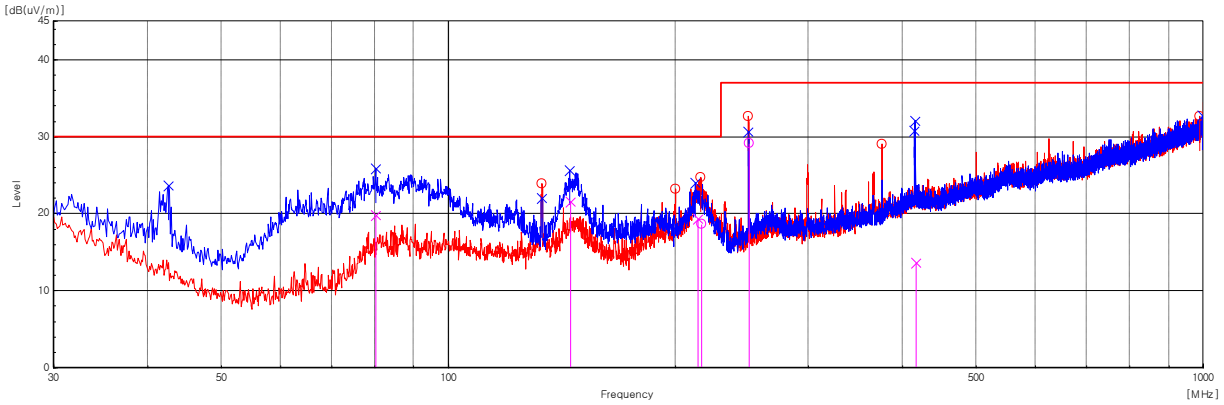


Frequency [MHz]	POL	Reading QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
51.317	V	42.4	-23.2	19.2	30.0	10.8	287	343.7
139.347	V	31.9	-17.7	14.2	30.0	15.8	147	73.1
180.024	V	41.2	-19.2	22.0	30.0	8.0	134	14.0
189.879	V	40.7	-20.0	20.7	30.0	9.3	119	7.5
986.778	V	20.7	-0.1	20.6	37.0	16.4	384	4.0
998.114	H	20.9	0.3	21.2	37.0	15.8	322	49.8

Note) Receiving antenna polarization : Horizontal and/or Vertical
Test Distance : 10 m, Antenna Height : 1 m to 4 m
Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)
Margin QP (Quasi-Peak) = Limit – Level QP

- **Configuration 2, Operating Mode 2 : USB Printing(Duplex)**

Test Graph and Results

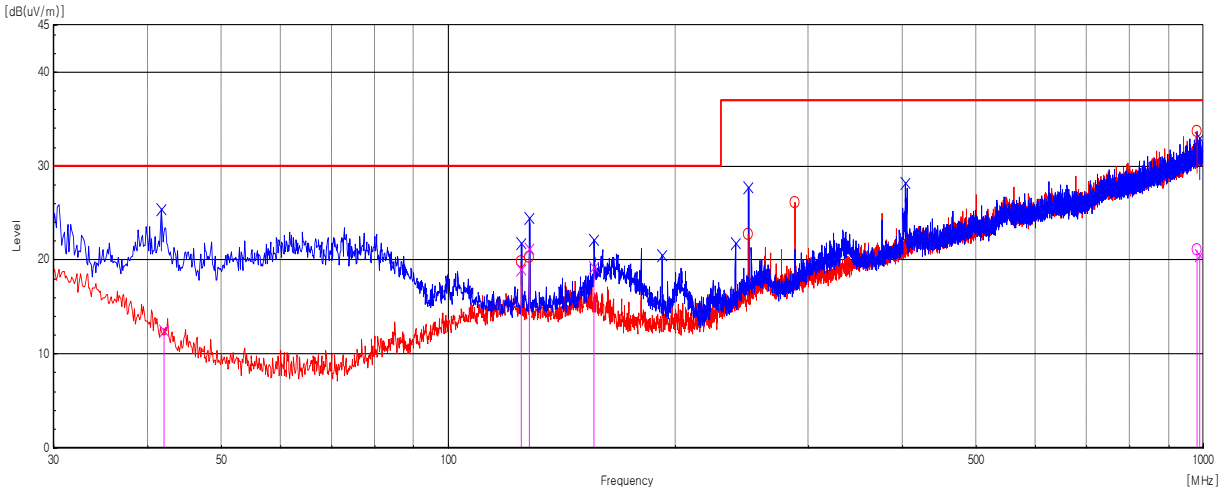


Frequency [MHz]	POL	Reading QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP[dB]	Height [cm]	Angle [deg]
80.214	V	42.5	-22.7	19.8	30.0	10.2	284	110.4
145.109	V	39.8	-18.2	21.6	30.0	8.4	112	26.1
213.876	V	38.6	-19.3	19.3	30.0	10.7	119	353.1
216.312	H	37.2	-18.5	18.7	30.0	11.3	369	22.1
250.005	H	44.6	-15.5	29.1	37.0	7.9	397	50.6
415.995	V	23.1	-9.5	13.6	37.0	23.4	124	2.3

Note) Receiving antenna polarization : Horizontal and/or Vertical
Test Distance : 10 m, Antenna Height : 1 m to 4 m
Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)
Margin QP (Quasi-Peak) = Limit – Level QP

- **Configuration 2, Operating Mode 3 : NETWORK Printing(Duplex)**

Test Graph and Results



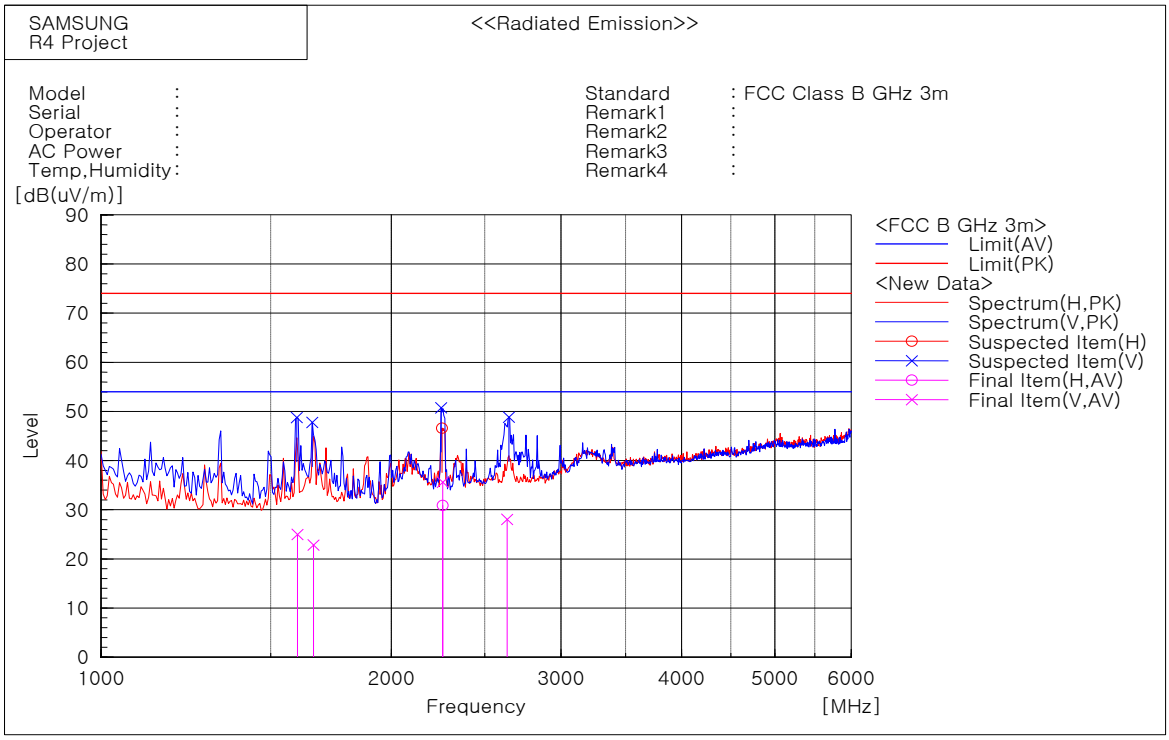
Frequency [MHz]	POL	Reading QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP[dB]	Height [cm]	Angle [deg]
41.986	V	31.8	-19.3	12.5	30.0	17.5	116	358.9
125.005	V	36.0	-17.0	19.0	30.0	11.0	134	289.3
127.984	V	38.3	-17.1	21.2	30.0	8.8	137	225.2
155.758	V	38.0	-18.8	19.2	30.0	10.8	119	323.9
979.087	H	21.2	-0.1	21.1	37.0	15.9	367	269.8
989.887	V	20.6	-0.1	20.5	37.0	16.5	139	358.9

Note) Receiving antenna polarization : Horizontal and/or Vertical
Test Distance : 10 m, Antenna Height : 1 m to 4 m
Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)
Margin QP (Quasi-Peak) = Limit – Level QP

5.2.4.2 1 GHz to 2 GHz test results

- **Configuration 1, Operating Mode 1 : Standby**

Test Results



Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1596.192	V	59.8	-11	48.8	74	25.2	108	318.4
1656.313	V	58.4	-10.6	47.8	74	26.2	108	293.8
2252.505	V	59.1	-8.4	50.7	74	23.3	108	92.8
2257.515	H	54.9	-8.3	46.6	74	27.4	108	73
2648.297	V	54.6	-5.8	48.8	74	25.2	108	94.8

Average Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1598.447	V	35.9	-10.9	25	54	29	108	313.4
1660.822	V	33.5	-10.6	22.9	54	31.1	108	289.4
2261.373	V	43.9	-8.3	35.6	54	18.4	108	91
2261.172	H	39.2	-8.3	30.9	54	23.1	108	70.8
2638.026	V	33.9	-5.8	28.1	54	25.9	108	108.2

Note1) Representative operating modes were selected by customer and any emissions that do NOT exceed Average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level PK (Peak) = Reading PK (Peak) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

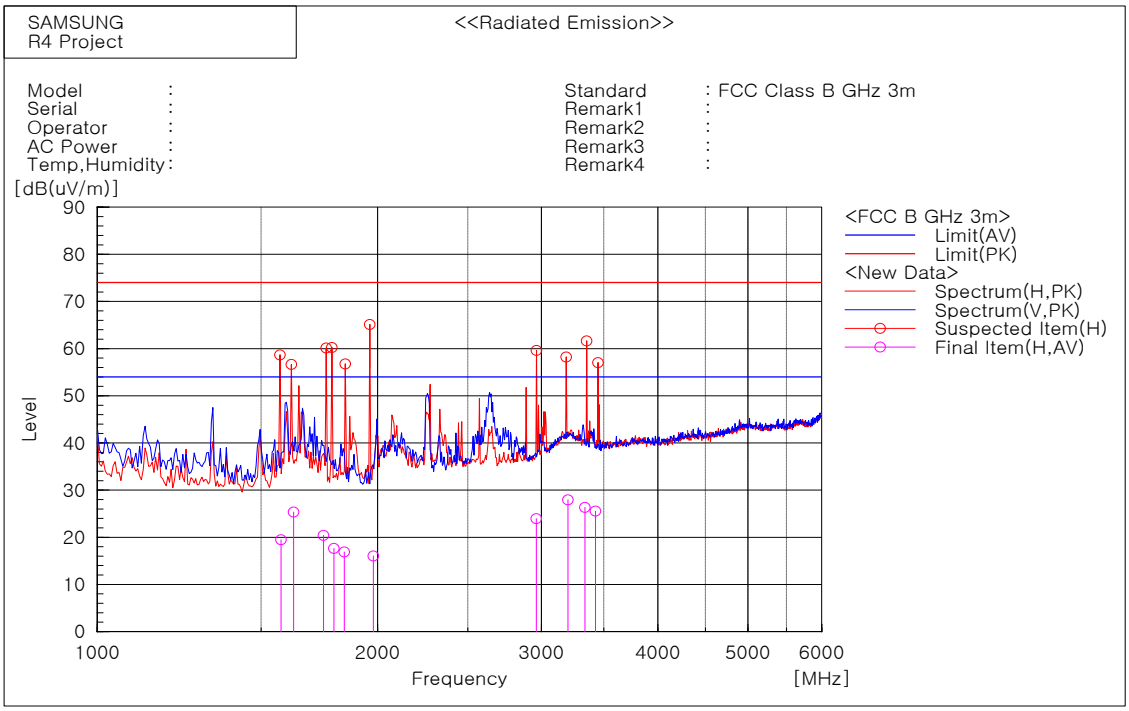
Level AV (Average) = Reading AV (Average) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 1, Operating Mode 2 : USB Printing (Duplex)**

Test Results



Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1571.142	H	69.9	-11.2	58.7	74.0	15.3	108	87.5
1616.233	H	67.4	-10.8	56.6	74.0	17.4	108	9.2
1761.523	H	70.5	-10.4	60.1	74.0	13.9	108	134.7
1786.573	H	70.5	-10.3	60.2	74.0	13.8	108	37.2
1846.693	H	66.5	-9.8	56.7	74.0	17.3	108	69.8
1961.924	H	73.7	-8.6	65.1	74.0	8.9	108	80.6
2963.928	H	64.1	-4.5	59.6	74.0	14.4	108	5.3
3189.379	H	58.1	0.1	58.2	74.0	15.8	108	20.5
3354.709	H	63.2	-1.6	61.6	74.0	12.4	108	12.9
3449.900	H	58.9	-1.9	57.0	74.0	17.0	108	167.3

Average Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1575.074	H	30.7	-11.2	19.5	54.0	34.5	108	299.4
1625.051	H	36.0	-10.7	25.3	54.0	28.7	108	91.5
1750.000	H	30.8	-10.4	20.4	54.0	33.6	108	22.5
1795.240	H	27.8	-10.2	17.6	54.0	36.4	108	305.6
1841.833	H	26.7	-9.8	16.9	54.0	37.1	108	351.2
1979.108	H	24.5	-8.5	16.0	54.0	38.0	108	61.8
2962.575	H	28.5	-4.5	24.0	54.0	30.0	108	347.7
3202.857	H	27.7	0.2	27.9	54.0	26.1	108	85.1
3340.081	H	27.7	-1.4	26.3	54.0	27.7	108	95.3
3428.307	H	27.5	-1.9	25.6	54.0	28.4	108	109.4

Note1) Representative operating modes were selected by customer and any emissions that do NOT exceed Average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level PK (Peak) = Reading PK (Peak) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

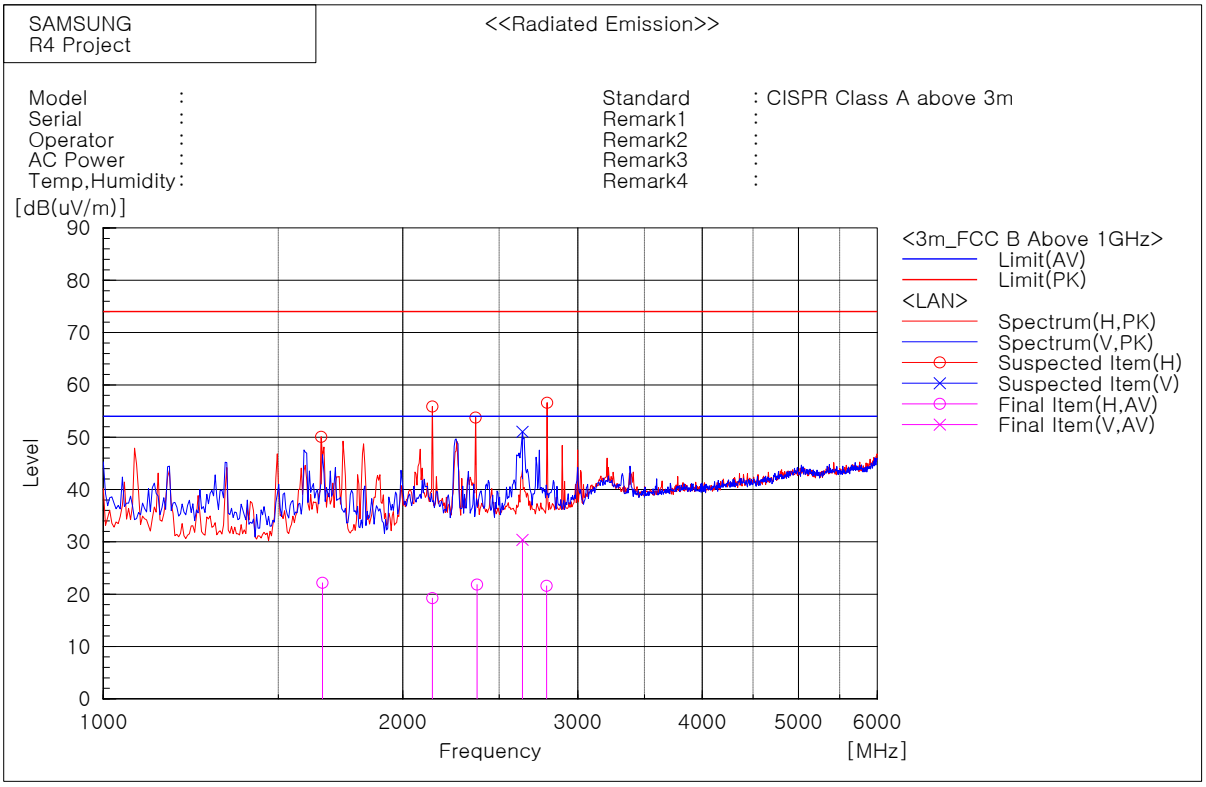
Level AV (Average) = Reading AV (Average) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 1, Operating Mode 3 : NETWORK Printing (Duplex)**

Test Results



Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1656.313	H	60.7	-10.6	50.1	74	23.9	108	334.9
2142.285	H	64.4	-8.5	55.9	74	18.1	108	355.2
2367.736	H	61.6	-7.8	53.8	74	20.2	108	322
2638.277	V	56.9	-5.8	51.1	74	22.9	108	105.9
2793.587	H	62.5	-5.9	56.6	74	17.4	108	356.8

Average Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1661.323	H	32.8	-10.6	22.2	54	31.8	108	335.1
2141.634	H	27.7	-8.5	19.2	54	34.8	108	80.6
2375.051	H	29.5	-7.7	21.8	54	32.2	108	78
2638.678	V	36.2	-5.8	30.4	54	23.6	108	97.3
2790.08	H	27.5	-5.9	21.6	54	32.4	108	73

Note1) Representative operating modes were selected by customer and any emissions that do NOT exceed Average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level PK (Peak) = Reading PK (Peak) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

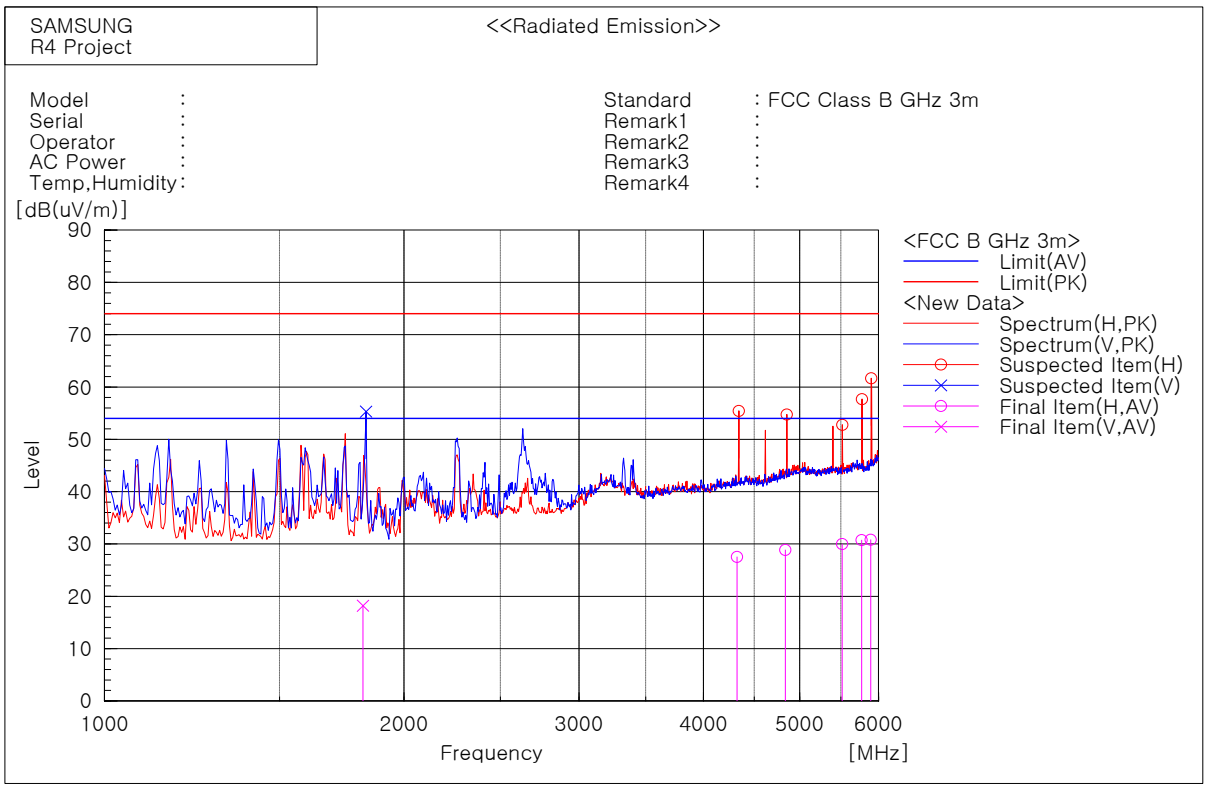
Level AV (Average) = Reading AV (Average) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average

- **Configuration 2, Operating Mode 1 : Standby**

Test Results



Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1831.663	V	65.2	-9.9	55.3	74.0	18.7	108	302.4
4341.684	H	54.5	0.9	55.4	74.0	18.6	108	231
4852.706	H	52.0	2.7	54.7	74.0	19.3	108	59.5
5519.038	H	48.7	4.1	52.8	74.0	21.2	108	34.9
5774.549	H	53.0	4.7	57.7	74.0	16.3	108	226.0
5899.800	H	56.2	5.5	61.7	74.0	12.3	108	59.5

Average Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1819.088	V	28.2	-10.0	18.2	54.0	35.8	108	314.4
4323.950	H	26.7	0.8	27.5	54.0	26.5	108	319.2
4836.373	H	26.1	2.7	28.8	54.0	25.2	108	287.7
5516.283	H	25.9	4.1	30.0	54.0	24.0	108	278.3
5769.589	H	26.0	4.7	30.7	54.0	23.3	108	4.8
5893.037	H	25.4	5.4	30.8	54.0	23.2	108	3.8

Note1) Representative operating modes were selected by customer and any emissions that do NOT exceed Average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level PK (Peak) = Reading PK (Peak) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

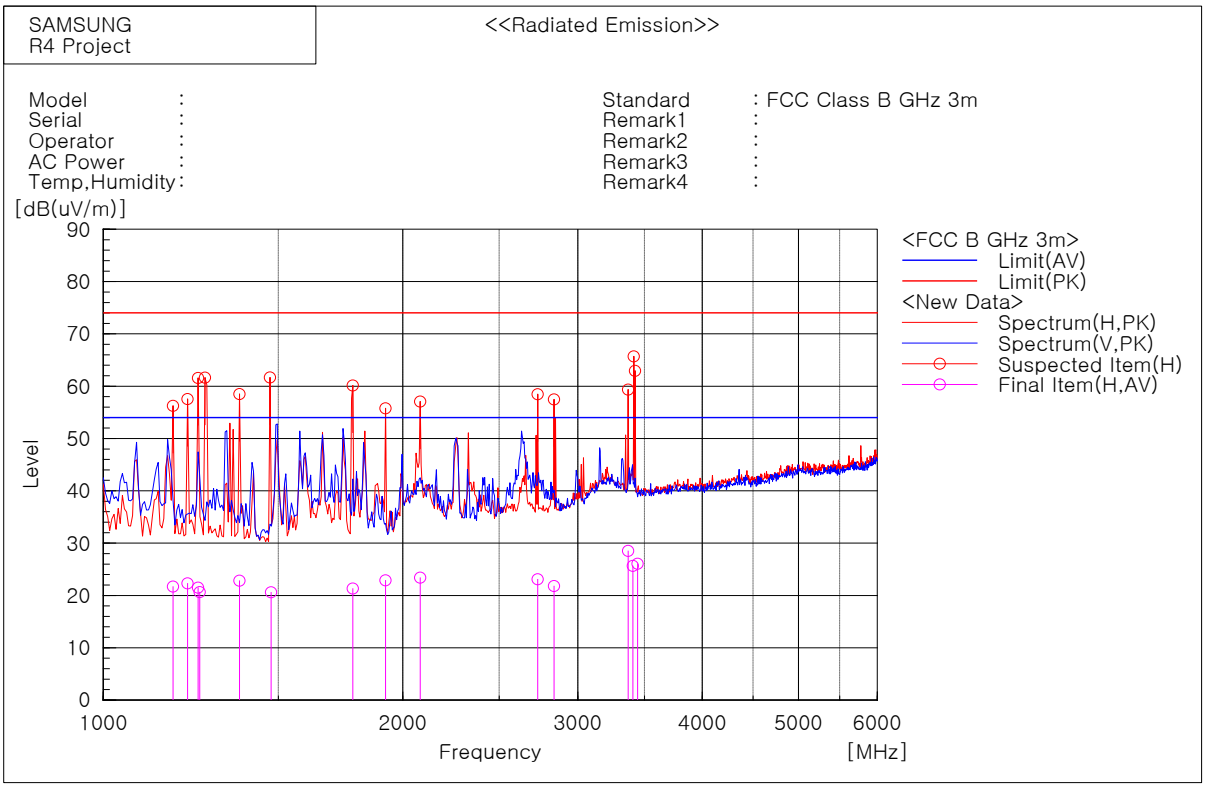
Level AV (Average) = Reading AV (Average) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 2, Operating Mode 2 : USB Printing (Duplex)**

Test Results



Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1175.351	H	69.3	-13.1	56.2	74.0	17.8	108	215.1
1215.431	H	70.6	-13.1	57.5	74.0	16.5	108	20.1
1245.491	H	74.7	-13.1	61.6	74.0	12.4	108	302.8
1265.531	H	74.7	-13.1	61.6	74.0	12.4	108	6.6
1370.742	H	71.4	-12.9	58.5	74.0	15.5	108	208.3
1470.942	H	74.1	-12.4	61.7	74.0	12.3	108	164.9
1781.563	H	70.4	-10.3	60.1	74.0	13.9	108	60.5
1921.844	H	64.7	-8.9	55.8	74.0	18.2	108	288.0
2082.164	H	65.5	-8.5	57.0	74.0	17.0	108	70.4
2733.467	H	64.4	-5.9	58.5	74.0	15.5	108	85.1
2838.677	H	63.3	-5.8	57.5	74.0	16.5	108	28.0
3369.740	H	61.1	-1.8	59.3	74.0	14.7	108	2.2
3414.830	H	67.6	-1.9	65.7	74.0	8.3	108	12.4
3424.850	H	64.8	-1.9	62.9	74.0	11.1	108	200.3

Average Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1175.351	H	34.8	-13.1	21.7	54.0	32.3	108	215.1
1215.431	H	35.4	-13.1	22.3	54.0	31.7	108	20.1
1245.491	H	34.6	-13.1	21.5	54.0	32.5	108	302.8
1249.950	H	33.7	-13.1	20.6	54.0	33.4	108	237.2
1370.742	H	35.7	-12.9	22.8	54.0	31.2	108	208.3
1474.950	H	33.0	-12.4	20.6	54.0	33.4	108	230.7
1781.563	H	31.6	-10.3	21.3	54.0	32.7	108	60.5
1921.844	H	31.8	-8.9	22.9	54.0	31.1	108	288.0
2082.164	H	31.9	-8.5	23.4	54.0	30.6	108	70.4
2733.467	H	29.0	-5.9	23.1	54.0	30.9	108	85.1
2838.677	H	27.6	-5.8	21.8	54.0	32.2	108	28.0
3369.740	H	30.3	-1.8	28.5	54.0	25.5	108	2.2
3407.115	H	27.5	-1.9	25.6	54.0	28.4	108	50.4
3445.342	H	28.0	-1.9	26.1	54.0	27.9	108	35.8

Note1) Representative operating modes were selected by customer and any emissions that do NOT exceed Average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level PK (Peak) = Reading PK (Peak) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

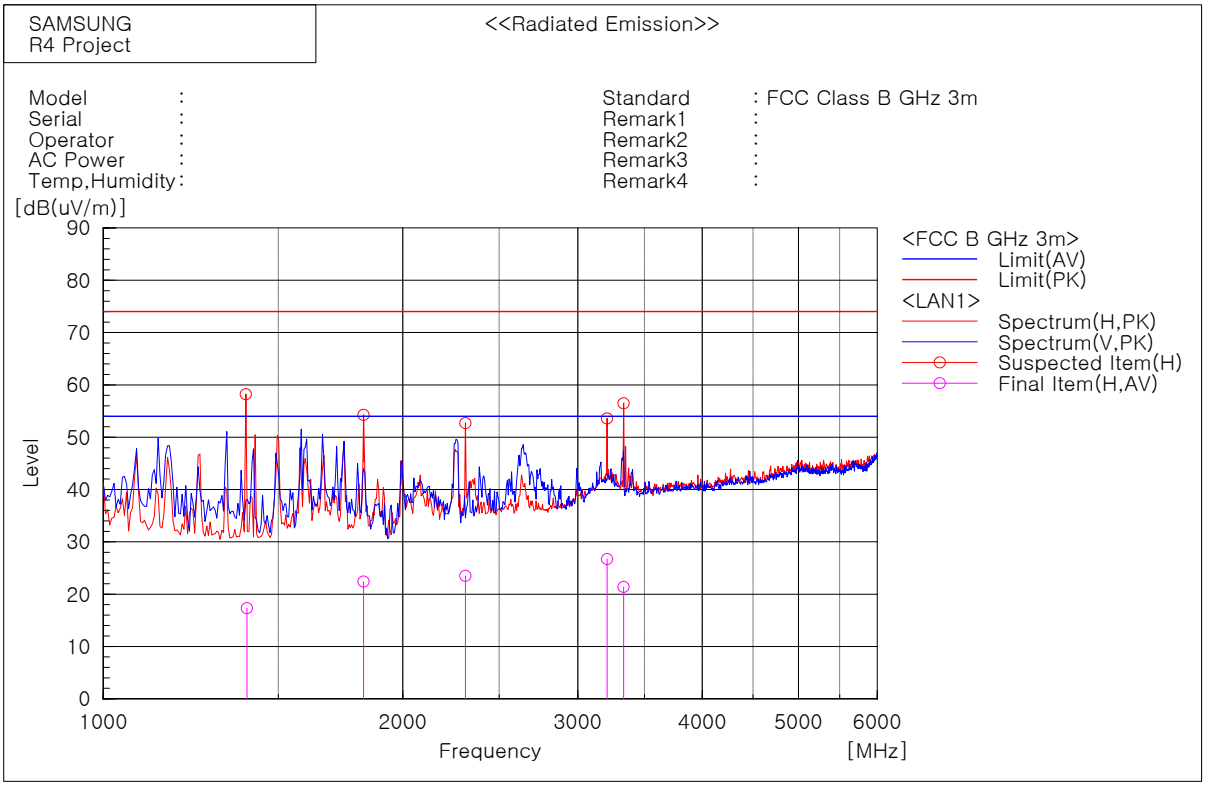
Level AV (Average) = Reading AV (Average) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 2, Operating Mode 3 : NETWORK Printing (Duplex)**

Test Results



Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1390.782	H	71.1	-12.9	58.2	74.0	15.8	108	336.7
3334.669	H	57.9	-1.4	56.5	74.0	17.5	108	312.1
1826.653	H	64.3	-10.0	54.3	74.0	19.7	108	214.3
3209.419	H	53.4	0.2	53.6	74.0	20.4	108	329.8
2312.625	H	60.8	-8.1	52.7	74.0	21.3	108	353.9

Average Measurement

Frequency [MHz]	POL	Reading PK [dB(μV)]	Factor [dB(1/m)]	Level PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1394.389	H	30.2	-12.9	17.3	54.0	36.7	108	332.7
1826.653	H	32.4	-10.0	22.4	54.0	31.6	108	214.3
2312.625	H	31.6	-8.1	23.5	54.0	30.5	108	353.9
3209.419	H	26.5	0.2	26.7	54.0	27.3	108	329.8
3334.669	H	22.8	-1.4	21.4	54.0	32.6	108	312.1

Note1) Representative operating modes were selected by customer and any emissions that do NOT exceed Average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level PK (Peak) = Reading PK (Peak) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Level AV (Average) = Reading AV (Average) + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average

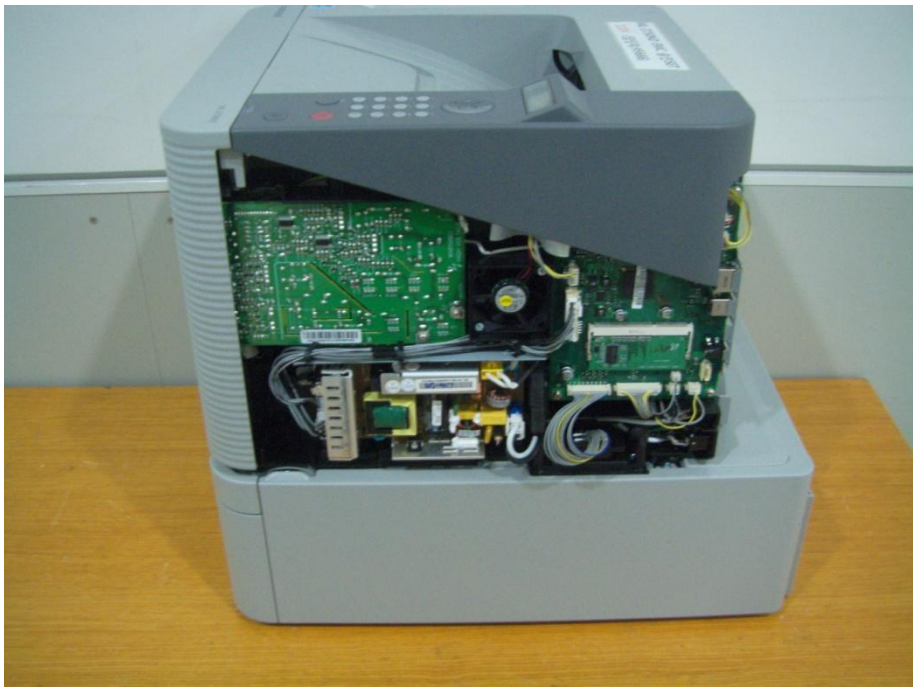
Appendix – EUT photography

Front View

Rear View with label location

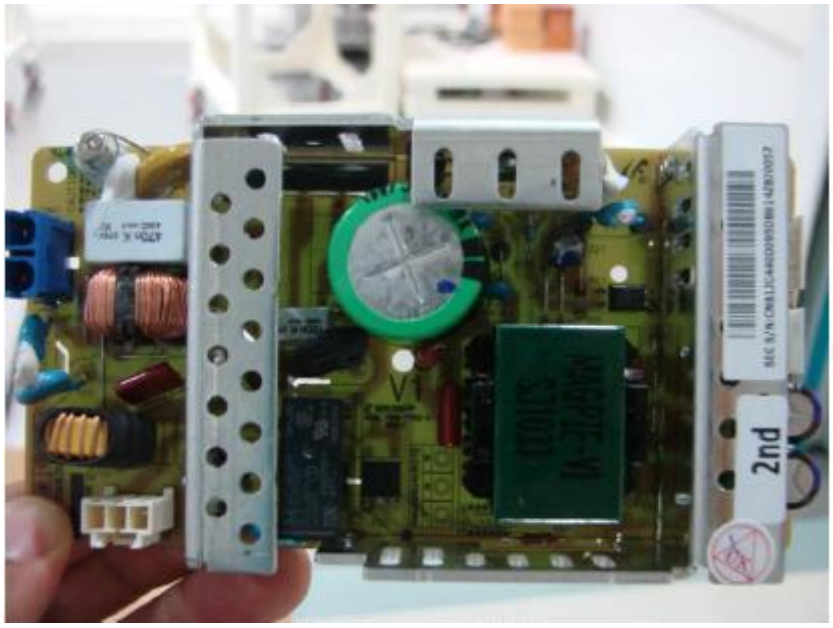
Front inside View

Rear inside View

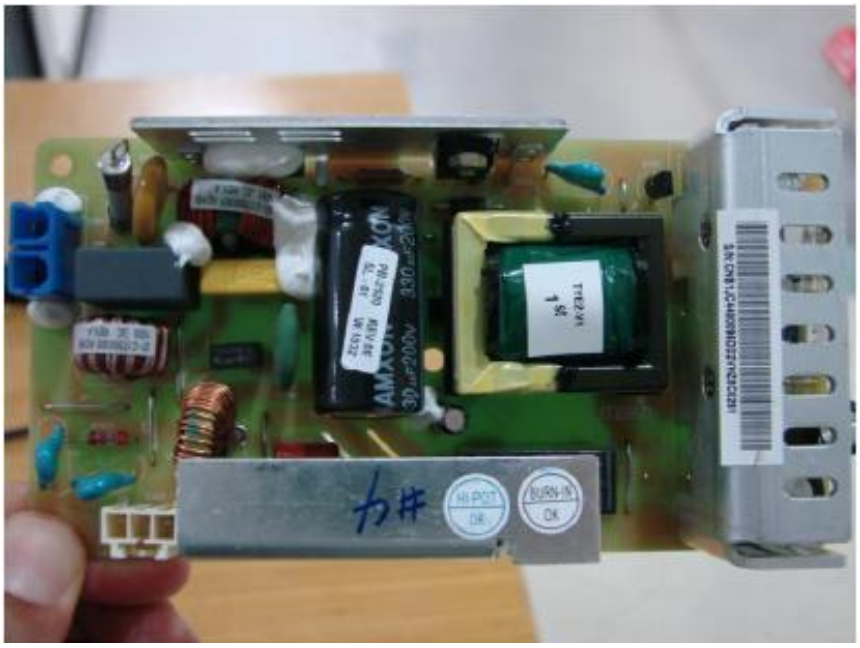


Left-inside View

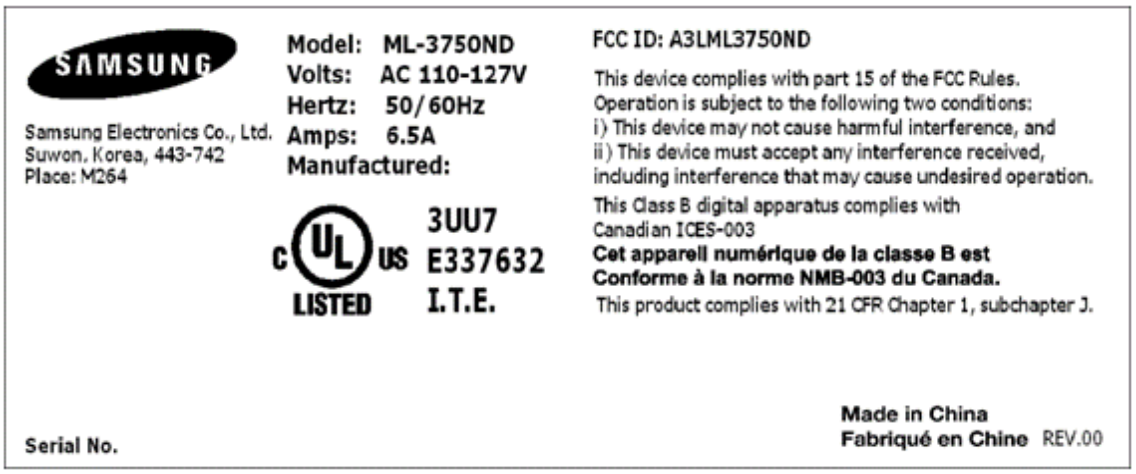
Right-inside View



Dongyang SMPS



LITEON SMPS



Label